

LCN Fund Full Submission

Supplementary Answer Form

Tick if this answer is Confidential: ☐

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Project code:	UKPNT205	Question Number	UKPNT205 - 30
Question date	1 October 2013	Answer date	4 October 2013
Submission section question relates to	Cost Benefit Analysis		
Topic	CBA		
Question	Please explain the cost-benefit analysis and the benefits to network customers - with specific regard to understanding the benefits that could be achieved through using this Method for clusters of fuel poor customers		
Notes on question			
Answer	<p>We recognise that the Expert Panel were not clear at our second bilateral presentation whether the Time-of-Use tariff which we were proposing as part of the project:</p> <ol style="list-style-type: none"> 1) would be enacted through the distributor's part of the bill (Distribution Use-of-System (DUoS) charge), the supplier's part of the bill, or a combination of both; 2) if it were a combination of both, the proportions in which it would be applied to the supplier's and the distributor's part of the bill; 3) how the tariff will be designed (irrespective of how it is applied to the bill) and whether it will reflect the network constraints; 4) whether the business case waterfall represented annualised savings or present value of all future savings; 5) how the costs and benefits in the business case waterfall had been calculated. <p>Separately, the Expert Panel wanted reassurance that the learnings around customer protection would be shared with other DNOs and suppliers.</p> <p>We answer these questions in turn below.</p> <p>How the tariff will be enacted</p> <p>The tariff will be enacted through the suppliers' part of the bill. Customers within the trial will receive electricity bills with the DUoS part unchanged.</p>		

The price signal will be presented through the suppliers' part of the bill. This is similar to trials such as Low Carbon London and Customer Led Network Revolution and reflects the way in which Time-of-Use tariffs will come to market. Both UK Power Networks and British Gas believe that Time-of-Use tariffs will be supplier-led and the supplier will act as the contact point for the customer.

The proportions in which the tariff will be applied to the supplier's and distributor's part of the bill

As stated above, the trial tariff will be applied fully to the supplier's part of the bill.

How the tariff will be designed and whether it will reflect the network constraints

We are not proposing that individual tariffs are designed for each region. Instead, the project is testing whether a tariff can be designed which meets the purpose of reducing the peak which is most driving secondary substation reinforcement at the licence area level; whilst still maintaining that it is a commercially viable tariff and applicable to the GB market. As such, the project will take secondary substation load profiles from the secondary substations in the trial area, blend these with load profiles from other secondary substations in our licence areas, and work with British Gas to design time bands and prices which encourage flattening of these profiles whilst providing suppliers benefit in the wholesale market and with imbalance.

The project will test by experiment whether fuel poor customers are able and willing to respond to this tariff. Finally, British Gas will use their expertise to check that the tariff will be marketable to a much wider demographic than just the fuel poor.

If these tests are successful, then we can have strong confidence that the tariffs which suppliers design and bring to market after the installation of Smart Meters will indeed be beneficial to the DNO and will also be attractive to fuel poor customers. It will demonstrate to suppliers and DNOs that it is in their financial interests as well as customers' interests to promote participation in Time-of-Use tariffs amongst the fuel poor community.

Whether the business case waterfall represented annualised savings or present value of all future savings

The business case waterfall represented the present value of all future savings and all future costs involved in achieving those savings. Present values of both costs and benefits were calculated using Ofgem's Cost-Benefit Analysis spreadsheet mandated for use in the RIIO-ED1 submission.

How the costs and benefits in the business case waterfall have been calculated

The project costs in the left-most column of the business case waterfall match the full submission spreadsheet and represent the full project costs, including the items of scope which are being funded by UK Power Networks and the partners.

The premise of the project has been that, if it can be shown that fuel poor

customers respond to Time-of-Use tariffs and energy efficiency campaigns, then the more customers who participate, the better for the DNOs. The enduring costs represent the present value of the costs incurred over an eight-year price control period for UK Power Networks to actively and heavily promote energy efficiency and Time-of-Use tariffs to the fuel poor communities in its three licence areas. It consists of an estimate of the staff time and funding required to develop partnerships with third party agencies such as Social Housing Landlords and NGOs and to carry out marketing campaigns, to a level that can draw down 10% of the total 'reservoir' of efficiency savings and demand shifting that might be possible.

Note that there is no component of the enduring costs which involves the DNO paying the supplier. This is distinctly different to the business case for Time-of-Use tariffs amongst the wider population, where the 'reservoir' of energy savings and demand shifting is greater, the population larger, and the participants more immediately able to participate. In this case, projects such as Low Carbon London and Customer Led Network Revolution are indeed validating whether a business case is strong enough to expect the DNO to co-fund such tariffs as an alternative to primary substation reinforcement.

The calculation of the benefits in the business case waterfall is set out on page 60 to 62 of our bid submission. The low-side estimate assumes that customers' behaviour is maintained for ten years and therefore that the effect of suppressing demand through energy efficiency and shifting peaks is maintained for ten years. The high-side estimate assumes these behaviours are essentially permanent.

Separate to these effects, we would hope that customers are emerging out of fuel poverty and becoming more affluent and gradually purchasing more consuming devices. This is not accounted for on the waterfall, but is instead treated as additional new economic load growth, which in turn can be mitigated through conventional reinforcement, or demand response.

How the benefit will materialise

The distribution of fuel poor and vulnerable groups is uneven due to socio-economic reasons. They tend to be geographically clustered; for example social housing estates are grouped. For that reason it may be easier to mobilise fuel poor customers participation in demand reduction and demand shifting as they have a common connection in the Social Housing Landlords and NGOs.

It is the substations in these geographic clusters of fuel poor that with their participation in demand reduction and demand shifting will end up not reaching capacity, therefore not trigger reinforcement at individual secondary substations. The sum of all these individual sites add up to a UK Power Networks level total of 2.5 – 5MW of demand reduction through time-shifting and additional demand reduction as a result of energy efficiency behaviours.

Customer protection

UK Power Networks provided an answer to question UKPNT205 – Q5 which tackled issues around self-disconnect. British Gas are committed to sharing learning from the project openly with other DNOs and suppliers with respect

	to customers' unintended exposure to additional costs, and how they can be protected under current regulatory regimes and any regulatory changes which would assist.
Attachments	
Verbal Clarifications (Consultants)	

Business Case Waterfall: as displayed on slide 12 at our second Expert Panel presentation with further detail:

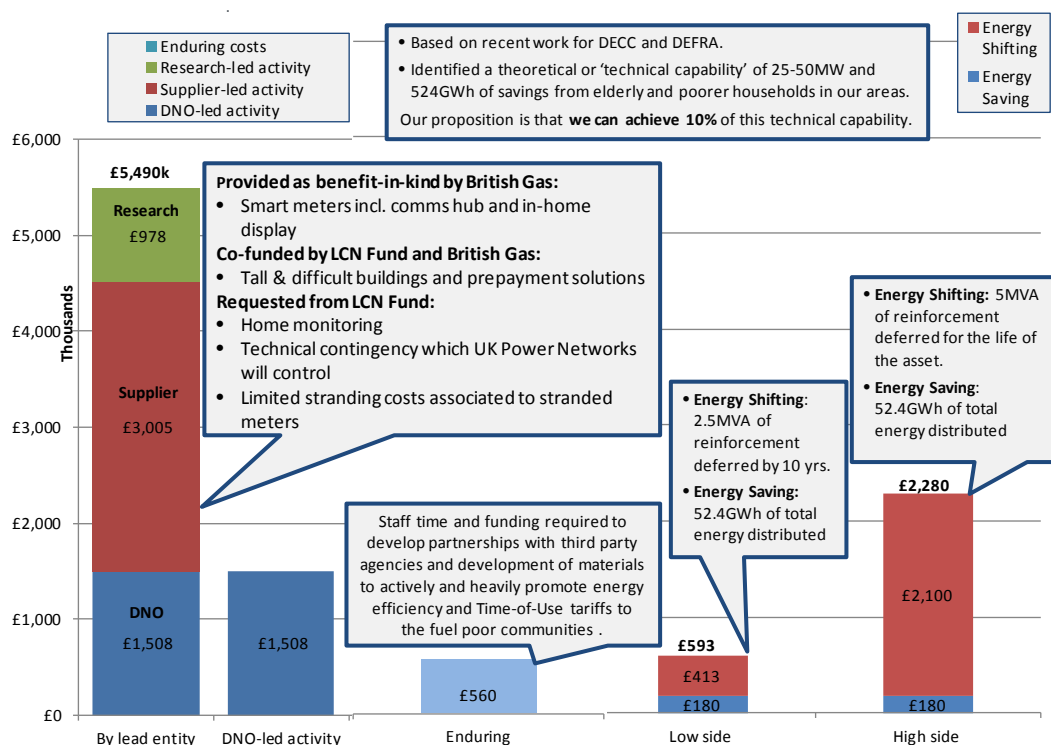


Figure 1 – Waterfall Chart

Focusing on the Network Benefits, Columns – 'Low side' and 'High side'

The high side and low side network benefits were calculated against two key categories:

1. **Energy Shifting:** Incentivising DSR through the introduction of a ToU tariff to encourage the fuel poor to shift their energy usage away from periods of peak demand.
2. **Energy Saving:** Reduction in the overall energy consumed by the fuel poor through energy saving advice and access to energy saving devices. Resulting in the suppression of network loads and an impact on asset utilisation.

Common data was used to calculate both network benefit categories:

(a) Based on the Household Electricity Usage Study (HEUS) household report that was undertaken on behalf of DECC and DEFRA. For the V-CEE calculations we focused on two of the Experian Mosaic Groups. These were [Refer to *Section 3: Project Business Case* and *Appendix H*]:

- Households dependant on benefits – Experian Mosaic Group 'Claimant Culture'
- Households dependant on the state pension – Experian Mosaic Group 'Elderly Needs'

For Energy Shifting:

From the HEUS household report: the GB wide technical peak shifting availability from the two groups was approx. 50-100MVA each, giving a combined potential of 100-200MVA. Therefore, as UK Power Network serves approx. 25% of GB domestic customers (7.8m domestic customers from 27m GB households). UK Power Networks (all three licences) has the potential for 25-50MW total technical peak shifting; 12.5–

25MVA availability from each of the two groups. UK Power Networks is exploring the possibility of 2.5–5MVA additional energy shifting.

- **Low side energy shifting figure:** This is where the period of differed demand is set to 10 years and the level of demand deferred taken as 2.5MVA, the lower end of the estimated range of benefits. It is assumed there are no avoided costs from Industrial and Commercial (I&C) customer DSR. Anticipated saving **£413k**
- **High side energy shifting figure:** This is where the period of differed demand is set indefinite, the lifetime of the asset and the level of demand deferred taken as 5MVA, the higher end of the estimated range of benefits. It is assumed there are no avoided costs from Industrial and Commercial (I&C) customer DSR. Anticipated saving **£2.1m**

For Energy Saving:

From the HEUS household report: The technical potential within the segment dependent on the state pension is estimated to be 655kWh/annum per household and the segment in receipt of benefits is estimated to be 353kWh/annum per household. In both cases, these rise to well over 1000kWh/annum when aspects of heating load are included. Therefore, the range of potential savings approx. matches the 655kWh/year figure. Thus 655kWh/year was selected for the V-CEE project.

- **Low side and high side energy saving figure:** The percentage reduction in energy distribution was calculated, using UK Power Networks 2011 figure of 83216GWh distributed over the three licence areas, and taking the number of fuel poor customers across the three licence areas as 800,000 using the Sub-regional Fuel Poverty Levels, England (DECC, 2011) in the equation:

$$\text{Percentage savings} = \frac{10\% \times \text{Technical potential} \times \text{no. of customers}}{\text{GWh distributed} \times 1000000} \times 100$$

This gives a percentage saving of 0.063% (52.4GWh) of UK Power Networks total energy distributed. Using the 2011 total reinforcement spend across UK Power Networks at £282m and applying the 0.063% results in an anticipated saving of **£180k**.